What is claimed:

1. A design method of an optical system using an evaluation function comprising

a step for setting an initial value which sets up an optical parameter in a design state where a production error has not been taken into consideration,

a step for making/renewing, where an optical parameter in a production is made by adding the production error to the optical parameter in the design state, or the production error of the optical parameter in an existing production state is renewed,

a step for making the evaluation function which makes the evaluation function, and

a step for performing optimization which determines an optimal optical parameter by optimizing the evaluation function.

2. The design method of an optical system according to claim 1, wherein in the step for making for the production state · renewing, a quantity of the production error to be applied is acquired, based on a value in a table of an amount of error which has been established beforehand according to a requirement for acquisition of an amount of a production error, the amount of the error is applied to an optical parameter in the design state, and thus an optical parameter in the production state is newly made, or a value of the amount of error which has been applied to the optical parameter in the existing production state is renewed according to change of the optical parameter in the design state.

3. The design method of an optical system according to claim 1, wherein in the step for making an evaluation function, at least one production error sensitivity parameter determined, based on the optical performance of the design state and the production state is included as an evaluation parameter,

in addition to the evaluation parameter of the evaluation function.

4. A design method of an optical system comprising a step for setting an initial value which sets up a value in a design state as a value of an optical parameter,
a step for setting a production state which sets up a value in the production state as a value of an optical parameter a step for making an evaluation function which makes an evaluation function in which a production state is a variable, and
a step for performing optimization which optimizes the evaluation function, wherein a value in the production state is set up by adding a predetermined amount of error to the value in the design state.

5. The design method of an optical system according to claim 4, wherein an amount of error is determined, based on a value of a table of an amount of error.

6. The design method of an optical system according to claim 5, wherein a value of the table of an amount of error is determined, based on an actual production function.

7.The design method of an optical system according to claim 5, wherein a table of an amount of error is composed by combination of a kind of production error and a kind of optical parameter.

8. The design method of an optical system according to claim 5, wherein the kind of production error contains at least one of Newton error, astigmatism, a wall thickness error, a tilt eccentricity, and a shift eccentricity.

9. The design method of an optical system according to claim 5, wherein the kind of optical parameter contains at least one of a radius of curvature, a lens thickness, and a lens interval.

10. The design method of an optical system according to claim 5, wherein a range in which an optical parameter can be taken in the error table is divided into two or more numerical value ranges.

11. The design method of an optical system according to claim 10, wherein an amount of error is set up to each of two or more numerical value ranges.

12. The design method of an optical system according to claim 4, wherein a step for renewing a production state further provided, and the step for renewing a production state is renewed to a new production error with change of the value of the optical parameter in a design state, based on the table of an amount of error.

13. A processing apparatus comprising an operation section for performing the design method of an optical system according to claim 1, an input section which inputs information required for the operation, an output section which outputs an operation result, and a memory section which memorizes an operation result.